RUST GEOTECH INC.

Spectral Gamma-Ray Borehole
Log Data Report

Borehole 60-10-07

Log Event A

Borehole Information

Farm : U	**Tank :** U-110	**Site Number :** 299-W18-148
N-Coord : 37,857	**W-Coord :** 75,657	**TOC Elevation :** 666.86
Water Level, ft :	**Date Drilled :** 2/28/1974	

Casing Record

Type : Steel-welded	Thickness, in. : 0.280	ID, in. : 6
Top Depth, ft. : 0	Bottom Depth, ft. : 120	

Borehole Notes:
The zero reference is the top of the steel casing. The casing is in a 2-ft diameter concrete donut. The donut is 4-in. above the ground surface. There is no riser pipe or other unusual configuration around the borehole location.

Equipment Information

Logging System : 1	**Detector Type :** HPGe	**Detector Efficiency:** 35.0 %
Calibration Date : 10/1995	**Calibration Reference :** GJPO-HAN-3	**Logging Procedure :** P-GJPO-1783

Log Run Information

Log Run Number :	1	**Log Run Date :**	12/4/1995	**Logging Engineer:**	Bob Spatz
Start Depth, ft.:	0.0	**Counting Time, sec.:**	100	**L/R :** L **Shield :**	N
Finish Depth, ft. :	45.0	**MSA Interval, ft. :**	0.5	**Log Speed, ft/min.:**	n/a

Log Run Number :	2	**Log Run Date :**	12/5/1995	**Logging Engineer:**	Bob Spatz
Start Depth, ft.:	121.0	**Counting Time, sec.:**	100	**L/R :** L **Shield :**	N
Finish Depth, ft. :	58.0	**MSA Interval, ft. :**	0.5	**Log Speed, ft/min.:**	n/a

Log Run Number :	3	**Log Run Date :**	12/4/1995	**Logging Engineer:**	Bob Spatz
Start Depth, ft.:	59.0	**Counting Time, sec.:**	100	**L/R :** R **Shield :**	N
Finish Depth, ft. :	50.5	**MSA Interval, ft. :**	0.5	**Log Speed, ft/min.:**	n/a

Borehole 60-10-07

Log Event A

Log Run Number :	4	**Log Run Date :**	12/4/1995	**Logging Engineer:**	Bob Spatz
Start Depth, ft.:	51.5	**Counting Time, sec.:**	100	**L/R :** L	**Shield :** N
Finish Depth, ft. :	44.0	**MSA Interval, ft. :**	0.5	**Log Speed, ft/min.:**	n/a

Log Run Number :	5	**Log Run Date :**	12/5/1995	**Logging Engineer:**	Bob Spatz
Start Depth, ft.:	26.0	**Counting Time, sec.:**	100	**L/R :** L	**Shield :** N
Finish Depth, ft. :	15.0	**MSA Interval, ft. :**	0.5	**Log Speed, ft/min.:**	n/a

Analysis Information

Analyst : H.D. Mac Lean

Data Processing Reference : P-GJPO-1787 Analysis Date : 6/10/1996

Analysis Notes :

Five log runs were required to complete the log of this borehole. Two high count-rate areas in the borehole were repeated to obtain overlapping logs. In one of the areas, the high dead time did not permit data collection (count rate exceeded 500,000 cps). One of the log runs repeated a previously logged section of the borehole specifically for the purpose of comparing results of repeated log runs. Other data overlaps occurred when portions of the same depth intervals were logged by different runs. The radionuclide concentrations calculated in these overlapping portions of the borehole were within the statistical uncertainty of the measurements, indicating acceptable repeatability.

The pre- and post-field verification spectra indicate that the logging system was operating properly during data collection. The energy/channel drift observed during the logging runs remained within an acceptable range for the search parameters used by the processing software; multiple energy calibrations were not required to process the data. The monitored portions of the verification spectra indicated no deterioration in the efficiency of the detector.

The casing thickness is presumed to be 0.280 inch (in.) on the basis of published thickness for schedule-40, 6-in. steel casing. Casing-correction factors for a 0.280-in.-thick steel casing were applied during analysis.

Cs-137 was the only man-made radionuclide detected. Cs-137 occurred almost continuously between the surface and a depth of 64.5 ft. The contaminant concentration in this portion of the borehole ranged from 3 pCi/g to more than 655 pCi/g. In addition, Cs-137 was recognized in detectable amounts between depths of 67.5 and 68.5 ft and between 77.5 and 78.5 ft. Intermittent occurrences of detectable Cs-137 were also observed at depths of 82.5 ft, 88.5 ft, between 98 and 99.5 ft, at 106.5, 109, and 114 ft, and at the bottom of the borehole. A zone of high Cs-137 concentration occurs between depths 53 and 58 ft. The highest measured Cs-137 concentration in this zone was 462 pCi/g; however, the instrument dead-time did not allow for data collection between depths of 52 and 57 ft (count rate exceeded 500,000 cps). Cs-137 concentration below the 62 ft depth varied from about 0.2 pCi/g to slightly more than 1 pCi/g.

Details regarding the interpretation of the data for this borehole are presented in the Tank Summary Data Report for tank U-110.

Log Event A

Borehole 60-10-07

Log Plot Notes:

Separate log plots show the man-made (e.g., Cs-137) and the naturally occurring radionuclides (K-40, U-238, and Th-232). The natural radionuclides can be used for lithologic interpretations. The headings of the plots identify the specific gamma rays used to calculate the concentrations.

A portion of this suite of logs is presented on a larger scale to show the repeatability of the radionuclide concentration calculations. Radionuclide concentrations calculated from the repeat run fall within the uncertainty of the values calculated from the original log run.

A combination plot includes both the man-made and naturally occurring radionclides, the total gamma derived from the spectral data as well as the Westinghouse Hanford Company (WHC) Tank Farms gross gamma log. The gross gamma plot displays the latest available digital data from WHC with no attempt to adjust the depths to coincide with the SGLS data.

Uncertainty bars on the plots show the statistical uncertainties for the measurements as 95-percent confidence intervals. The minimum detection level (MDL) is shown by open circles on the plots. The MDL of a radionuclide represents the lowest concentration at which positive identification of a gamma-ray peak is statistically defensible.